

Amendments to the Claims

Claims 1-29 (cancelled).

Claim 30 (original): A mass separator comprising first and second sets of electrode components, individual ones of the components comprising a surface, wherein, in a cross section, the surfaces of the first set of components oppose each other, the surfaces of the second set of components oppose each other, and the surfaces of the first and second sets of components define a volume, the volume comprising a first distance corresponding to a half a distance intermediate opposing surfaces of the first of components and a second distance corresponding to a half a distance intermediate opposing surfaces of the second set of components, wherein, a ratio of the first distance to the second distance comprises from about 0.84 to about 1.2.

Claim 31 (original): The mass separator of claim 30 wherein the mass separator comprises an ion trap and the surface of the first component comprises the surface of at least one of the end caps of the ion trap and the surface of the second component comprises the inner surface of the ring electrode of the ion trap.

Claim 32 (original): The mass separator of claim 31 wherein the ion trap comprises a cylindrical ion trap.

Claim 33 (original): The mass separator of claim 31 wherein the end caps comprise stainless steel mesh.

Claim 34 (original): The mass separator of claim 30 wherein the first set of components are orthogonally related to the second set of components.

Claims 35-67 (cancelled).

Claim 68 (new): The mass separator of claim 31 wherein at least one of the end caps comprises a solid material having a centrally located aperture.

Claim 69 (new): The mass separator of claim 31 wherein at least one of the end caps comprises mesh.

Claim 70 (new): The mass separator of claim 30 wherein the ratio has an associated spacer maximum factor and the mass separator further comprises an electrode spacing between at least one of the first components and at least one of the second components and corresponding spacer maximum value.

Claim 71 (new): The mass separator of claim 31 wherein at least one of the end caps further comprises an opening.

Claim 72 (new): The mass separator of claim 71 wherein the opening is aligned with the volume center.

Claim 73 (new): The mass separator of claim 31 wherein the ion trap comprises a cylindrical ion trap comprising an electrode spacing distance between individual ones of the end caps and the ring electrode, wherein the electrode spacing distance is related to the ratio.

Claim 74 (new): The mass separator of claim 73 wherein the electrode spacing distance is related to the ratio by a spacer maximum factor.

Claim 75 (new): The mass separator of claim 74 wherein the electrode spacing distance is less than the product of the spacer maximum factor times the second distance.

Claim 76 (new): The mass separator of claim 30 wherein the mass separator is coupled to a mass detector.